

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - AFT-RCS FMEA NO 05-6KA-2090 -1 REV: 11/03/87

ASSEMBLY : AFT LCA 3 CRIT. FUNC: 1R
 P/N RI : RWR80S1211FR CRIT. HDW: 3
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 2 EFFECTIVITY: X X X
 : TWO PHASE(S): PL X LO X OO X DO X LS X
 :

PREPARED BY: DES D SOVEREIGN APPROVED BY: REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
 REL J BEEKMAN DES D. S. [Signature] APPROVED BY (NASA) SSM
 QE [Signature] REL [Signature] QE [Signature]
 [Additional signatures and dates are present in the original document]

ITEM:

CURRENT LIMIT RESISTOR (1.2 KILO OHM, 2 WATT) - LEFT AND RIGHT AFT RCS FUEL AND OXIDIZER MANIFOLD 5 ISOLATION VALVE LOGIC AND MEASUREMENT CIRCUIT POWER.

FUNCTION:

THE INDIVIDUAL CIRCUIT RESISTORS CONDUCT CIRCUIT POWER AND PROVIDE CURRENT LIMITING TO THE FUEL AND OXIDIZER MANIFOLD 5 ISOLATION VALVE LOGIC AND MEASUREMENT CIRCUIT POSITION SWITCHES.
 56V76A123R (J4-21,22), R(J8-66,67).

FAILURE MODE:

OPEN, ELEMENT OPENS, HIGH RESISTANCE.

CAUSE(S):

STRUCTURAL FAILURE, VIBRATION, MECHANICAL SHOCK.

EFFECT(S) ON:

(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE

(A) LOSS OF CIRCUIT POWER.

(B) LOSS OF INTERFACE FUNCTION - THE AFFECTED VALVE POSITION INDICATION MEASUREMENTS, VISUAL INDICATORS AND SOLENOID POWER INHIBIT LOGIC INPUTS ARE NOT ENERGIZED. NO EFFECT - OTHER COMPONENTS IN THE SOLENOID CIRCUIT MUST CONDUCT BEFORE THE CIRCUIT IS ENERGIZED.

(C, D) NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECT - POSSIBLE LOSS OF CREW/VEHICLE DUE TO VALVE OVERHEATING AND PROPELLANT DECOMPOSITION BY CONTINUOUS SOLENOID COIL POWERING LEADING TO VALVE RUPTURE AND PROPELLANT RELEASE. REQUIRES 2 OTHER FAILURES (SWITCH SHORT, TYPE IV "OPEN/CLOSE" DRIVER FAILS ON) BEFORE EFFECT IS MANIFESTED. THE FAILURE STRING COULD BE UNDETECTABLE AFTER THE FIRST FAILURE DUE TO LACK OF MEASUREMENT INDICATIONS FOR THE TYPE III AND TYPE IV HYBRID DRIVERS.

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DISPOSITION & RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

(A-D) FOR DISPOSITION AND RATIONALE REFER TO APPENDIX E, ITEM NO. 3 - WIRE WOUND RESISTOR.

(B) GROUND TURNAROUND TEST

COMPONENT CHECKED OUT EVERY FLIGHT DURING GROUND TURNAROUND. THE TESTING CONSISTS OF CYCLING VALVE MANUAL SWITCHES AND/OR SENDING GENERAL PURPOSE COMPUTER (GPC) COMMANDS TO CYCLE VALVES OR HEATERS WHILE MONITORING VEHICLE INSTRUMENTATION TO DETERMINE IF COMPONENTS HAVE FAILED.

(E) OPERATIONAL USE

NO ACTION FOR FIRST FAILURE - NOT DETECTABLE. IF HYBRID DRIVER FAILS ON, MINIMIZE RISK OF CONTINUOUS POWER SITUATION BY PULLING APPROPRIATE CIRCUIT BREAKER. CIRCUIT BREAKERS WILL BE RESET WHEN VALVE IS TO BE MOVED.